**Summary**

DMTCP (Distributed MultiThreaded CheckPointing) is a widely used package for transparent checkpoint-restart. Checkpoint-restart is the ability to save to disk the state of a running process, possibly copy it to a new computer, and then to restart the process where it left off. DMTCP has evolved from a monolithic package to a highly adaptable package spanning a range from laptops to cloud computing to MPI and supercomputing.

**Motivation: A growing list of use cases**

- fault tolerance
- process migration
- save/restore of workspace (for interactive sessions)
- fast startup (checkpoint after initialization)
- chaining of long-running program in batch
- debugging (lastckpt before bug)
- the ultimate bug report

**DMTCP is the only package for distributed, user-space checkpointing**

- DMTCP is now in its second decade of development.
- Downloads:

**DMTCP, HPC, and Supercomputing**

- Choice of MPI: e.g., Intel MPI, MVAPICH, Open MPI
- Plugin for RDMA-based fabric (e.g., InfiniBand)
- Plugin for Resource Manager (e.g., SLURM)
- Plugin for Process-Management Interface (e.g., PMI)

**Virtualizing InfiniBand hardware for checkpoint-restart**

**Innovations by other groups using DMTCP**

(See “google DMTCP publications” for a longer list.)

**Intel Corporation:** “Be Kind, Rewind — checkpoint & restore capability for improving reliability of large-scale semiconductor design”, Igor Lubuncic, Ravi Giri, Avikam Rozenfeld, and Andrew Goldis, 2014 IEEE High Performance Extreme Computing Conference (HPEC-2014), “Intel IT has partnered with the Northeastern University (NEU) Distributed Multi-Threaded Checkpointing (DMTCP) team ...” [Abstract] “Most importantly, our project has led to a number of significant improvements in the core functionality of the technology, which can only be fully realized when coupled with a complex ecosystem like Intel’s chip design environment, due to its unique scope and size. Exciting future milestones will include checkpointing for EDA tools, and a complete integration with Intel’s batch-like distributed management solutions.” [Conclusion]


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